100 McCaul St.
Toronto,
Ontario
M5T 1W1

PRINCIPLES 0F **INTERACTION DESIGN**

GDES 1B26

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Professor Martha Ladly
mladly@faculty.ocad.ca
My Office: rm. 622
Office hours:
Wed & Thurs 3:30-6:00

Class Assistant: Noelle Hindi
Contact: noelle.j.h@gmail.com

A DEFINITION OF INTERACTION DESIGN

Interaction Design is the study of principles, techniques, tools, and processes for designing interactions and objects with which and through which people interact.

Interaction Design is concerned with the design of the user experience; the use-ability and the flow of functional tasks that express and allow the full performance of a product, a material, a system, an interactive installation or environment.

Course Outline

1. COURSE DESCRIPTION

This course is an introduction to the design methodologies used in time-based media and an examination of the relationship between people and interactive mediums. Students are exposed to the characteristics of virtual space and the new design opportunities made feasible by digital technology. Through lectures, analysis of a wide range of examples of communication and interaction design and through studio projects that provide practical experience, students are introduced to the basic concepts, methods, tools and techniques used in the definition and design of interactive spaces, intuitive digital navigation and the integration of entertainment into interactive information.

2. LEARNING OUTCOMES:

1 The student will demonstrate knowledge of the multifaceted communication between people and technology and its applications in contemporary design practice through:
  a) interactive environments and products;
  b) interactive information design:
  c) interaction and intuitive navigation.

2 Through theoretical and practical applications students will become acquainted with the methods of interaction, the rules, styles and design guidelines used in best practice worldwide through:
  a) information interaction methods;
  b) user observation;
  c) metaphors as tools for interaction.

3 Students will be able to use cognitive and physical factors in designing outcomes which improve the usability of products and systems, and in the creation of a compelling experience of use through:
  a) cognitive mapping;
  b) perception;
  c) sensorial design.

4 The student will demonstrate knowledge in the techniques of user observation and evaluation and the fundamental methods of workflow and experience design through:
  a) user-centred scenarios;
  b) interface and interactions;
  c) task and task analysis.

5 The student will demonstrate knowledge of the methods of storytelling and scenario based interaction design through:
  a) designing for flow and experience;
  b) compelling experiences;
  c) metaphor, narrative and narrative style.

3. TEACHING METHODS & DELIVERY:

Seminars and lectures provide the foundation of this course, with surveys of modern communication theory, information design, interaction and interface design, while in-depth case histories exemplify the practical application of the concepts, methods, techniques and tools of this emerging field. Teaching methods and delivery will include a combination of lectures, demonstrations, critiques, individual and group discussions, student presentations and in- class work.

The content is grouped around the following four major issues:

- Physical and Social Human Factors/Cognitive Psychology
- Theory and Methods of Interaction
- Tangible Interaction and the Design of Usability /Experience
- User Centered Scenarios and Story Telling

Key Issues to be covered by the course content:

- Cognitive Mapping and Perception
- Information Design
- Interaction Design
- Sensorial Design
- Data, Information, Knowledge and Wisdom
- Metaphor, Narrative, Narrative Style
- Storytelling and Scenario Building
- Designing the Experience
- User Centered Scenarios and Multiple Users
- Interface and Interaction, Task and Task Analysis
- Designing for Flow and Compelling Experience
- Gratifying User Experience
- Quality of Experience
- Desirability
- Usefulness & Useability
- Accessibility
- Affordances
- Constraints
- Concepts/ Perceptive Measures (Senses, Imagination, Emotion, Knowledge)
- Manner
- Material of Interaction
- Effects of Material on Form and Motion
- The time factor and Time Signature
- Social Rules and the Nature of the Experience
- Emotion
- Form/Motion
- Personality

4. LECTURES/COURSE DELIVERY

Week 01.	Introduction to Interaction Design
Week 02.	Narrative, Narrative Style
Week 03.	Mapping and Metaphor
Week 04.	Perception and Cognition
Week 05.	Sensorial Design
Week 06.	User Centred Task Analysis and Experience Design
Week 07.	Study Week - No Classes
Week 08.	Possible Field Trip
Week 09.	Interaction & User Scenario Building
Week 10.	The Process of Designing for Flow. Prototyping
Week 11.	User-Centred Design & Useability Testing
Week 12.	Collaboration, Execution
Week 13.	Interact 3! Get in, Show & Celebration, Get out
Week 14.	Interact 3! Analysis, Discussion, Review
Week 15.	Critiques, Evaluation

SUGGESTED TEXTS AND SOURCES

CORE TEXT:

Lidwell, W., K. Holden, J.Butler
Universal Principles of Design
Rockport, 2003.

The excellent book will serve as a designers guide for students of all design disciplines, and will be a useful text for all 4 years of study at OCAD. I suggest that you purchase this book, which is available in the OCAD Book Store. It is also on reserve for our course in the OCAD Library.

Apple Computer.
Macintosh Human Interface Guidelines.
Addison-Wesley, Reading, Mass., 1992.
Axelrod, R.
The Evolution of Co-operation.
New York: Harper/Collins, 1984.
Barlow, H. & Mollon, J. eds.
The Senses.
Cambr. Univ. Press. 1982.
Beardsly, Sally.
Conversations at the Interface.
Dansk Design Centre, 1994.
Beyer, H. and Holtzblatt, K.
Contextual Design.
San Francisco: Morgan Kaufman, 1998.
Bohm, D**.**
Thought as a System.
London: Routledge, 1994.
Bruce, V. , Green, P.R., & Georgeson M..
Visual Perception: Physiology, Psychology and Ecology.
3rd ed., Psychology Press, Hove. 1996.
Carroll, J.M., Mack, R.L, and Kellogg, W.A..
Interface metaphors and user interface design.
Helander, M. (ed.) Elsevier Science Publishers B.V. (North-Holland). 67-85. 1988.
Eysenck M.W.& Keane, M.T.
Cognitive Psychology.
(4th ed.) Hove: Psychology Press, 2000.
Gregory, R.L.
Eye and Brain
London: Oxford University Press. 1994.
Kelley, T., Littman, J.
The Art of Innovation
Doubleday, 2001
Norman, Donald.
Emotional Design
Basic Books, 2004.
Norman, Donald.
The Design of Everyday Things
Bantam Doubleday Dell, 1998.
Preece, Jennifer et al.
Interaction Design: beyond human-computer interaction
John Wiley & Sons, Inc., 2002.
Raskin, J.
The Humane Interface
Addison-Wesley, 2000.
Rauterberg, Matthias.
Human Perception, Cognition and Action
www.ipo.tue.nl/homepages/mrauterb/rauterberg.html. 2001.
Sekuler, R. & Blake, R.
Perception.
3rd ed. 1994.
Van Der Heijden, K.
Scenarios: the Art of Strategic Conversation.
New York: Wiley, 1996.

URL Reference and Resources:

Our Course web blog:

http://ocad-interactiondesign.blogspot.com

Blogging Resources:

Get blogging at
http://www.blogger.com/

Internet Archive
http://www.archive.org/

Our Media free on-line storage
http://www.ourmedia.org/

On-line photo storage/sharing
http://www.flickr.com/

Adobe & Macromedia	http://www.adobe.com/
Apple Computer	http://www.apple.com/
Art & Design blog	http://www.ncf.ca/~ek867/wood_s_lot.html
Bite sized entertainment	http://www.120seconds.com/
Canadian digital arts and culture	http://www.horizonzero.ca/
Canadian on-line talent	http://www.allmaple.com
Canadian youth art & issues site	http://www.terminus1525.ca/
CBC Radio3 & Podcasts & Archive	http://archive.cbcradio3.com/
Content is king	http://www.surfstation.lu
Cool Home Pages	http://www.coolhomepages.com/
Design community site	http://www.designiskinky.net
Design visualisation	http://www.flight404.com/
Designer's lunchbox	http://www.k10k.net
Digital news & design	http://www.digitalthread.com/
Established, respected news source	http://www.salon.com/
Free on-line bookmarks and more	http://spurl.net/
Flash Kit	http://www.flashkit.com/
Great get lost all day design portal	http://www.newstoday.com
Google books research resource	http://books.google.com/
IDEO Design	http://www.ideo.com/
Interaction Design Book	http://www.id-book.com/
It's Heavy music	http://www.heavy.com/
Joke US news source	http://www.theonion.com/
Nathan Shedroff home page	http://www.nathan.com/
Oculart	http://www.oculart.com
On-line art and writing experiments	http://bornmagazine.com/
Opinionated design news, reviews	http://www.pixelsurgeon.com/
Presstube	http://www.presstube.com/
Slashdot Nerd site	http://slashdot.org/
Tucows software, shareware	http://www.tucows.com/
This is broken	http://www.thisisbroken.com/
Turbulence Net Art	http://www.turbulence.org/
Ultra hip fashion & art	http://www.showstudio.com/
Useability, Accessibility	http://www.useit.com/
Webmonkey	http://www.webmonkey.com/
Web content & design primer	http://www.alistapart.com/
Web Reference	http://www.webreference.com/
Wikipedia Open Source reference	http://www.wikipedia.org/
6168 & Peter Horvath	http://www.6168.org/

PRINCIPLES 0F **INTERACTION DESIGN**

PROJECTS

Project Description

Photoshop Tennis - Express Yourself!

You will be working on this project with a partner – choose someone that you would like to work with. You will be working as an individual on your own pieces and in collaboration with your partner to create an ongoing image-based narrative. You will present your match as a team.

References:
http://www.g4tv.com/techtvvault/features/33510/Photoshop_Tennis.html?

http://www.baseboard.net/gallery/showgallery.php?cat=510&thumb=1

Grading Criteria
This project will be marked on your understanding and adherence to the brief; the originality and interest of the narrative you create with your partner; the originality of the images used; the inclusion of text and a variety of images; and your learning, progress and innovative use of collage, composition and the Photoshop software to edit your images and tell your story.
Grade total: 20%

Schedule: 2 weeks
Due Date: Week 3

PROJECT 1:

Create a Collaborative Image and Time-Based Narrative

It's a very simple idea. You will be telling a story, loosely based on your own images, with a partner. The first player creates a layer in a Photoshop document - create an image that tells your story using your own images and combining them with found images. Use your own design, artistic and aesthetic sensibility. Make it personal! Add text within the images to express yourself and briefly describe what you're doing. It can be technical, relate to your references or form an amusing dialogue / narrative.

Then you email the .psd to your partner / opponent. Your partner then personalizes the Photoshop document with their own images and text to express their own aesthetic and their own story. (Don't completely erase your partner's work at any time, it's a bit like cheating, and it ruins the game.) Save a jpeg of your image, then mail back the new version of your .psd document to your partner. You may consider using a chat client such as iChat, MSN or ICQ to transfer your files – they can hold larger data files than most email clients. If you find that your files are simply too bulky to email or transfer, flatten the layers in Photoshop before sending the image to your partner.

Each player progressively adds a layer until the match is over and you have created 6 images in total – 3 images each. Your match should take place over a maximum of 24 hours, but preferably over an evening – please log the times via the time log on your email, and include your considerations, technique, and your ongoing story.

Purpose

01. To gain familiarity with scanning and hands-on work with Photoshop, .psd files, transferring and sharing files over networks and the internet
02. To use your original materials and ideas to learn about the basics for creating a time-based interactive narrative
03. To gain experience of collaborative working methods

Specifications:

Size:	22.58 cm W x 16.93 cm H (640 x 480 pixels) a major consideration as you will be emailing!
Orientation:	landscape
Colour:	RGB – for smaller file size
Output: printout:	You may wish to convert your files to 4-colour process for on white paper stock

Deliverables
6 Printouts of your Tennis Match, 3 printouts each; process documentation of your online conversation with descriptions of your methods and ongoing story.

Schedule: 2 weeks. The first week will be in-class familiarization with Photoshop, scanning, file transfer, file sharing etc.

PRINCIPLES 0F **INTERACTION DESIGN** PROJECTS

Project Description

In teams of four students you are to videotape or photograph a common interaction between people and technology. Common examples are: the interaction of the Automatic Teller Machine, the interaction of filling your car with gas, the interaction of taking the TTC, the interaction of ordering food in a restaurant or fast food drive through, the interaction of using the elevator etc. Feel free to be creative and find an interaction that interests your group.

Shoot video or photos, make observations and take notes while you're participating in the interaction.

Note:
Digital camera access is limited. You can check out digital video cameras overnight from the A/V office on the third floor. All of your names are on a list of students that are authorized to borrow the cameras during the next two weeks. You will need to first go to the A/V office and sign up for a time slot, then come back at the appointed time to get the camera. Try to arrange to time-share the cameras with another group. If you have access to your own digital video or stills camera, by all means use it!

Grade total: 20%
Grading criteria will be provided
Schedule: 2 weeks
Due Date: Week 5

PROJECT 2:

Deconstructing an Interaction & Improving it

1. Review your ethnographic material and uncover the structure of the interaction.

2. Make an annotated map or diagram of the structure. Explain: What's important about the interaction? What works smoothly? What breaks down? Why? What are the actions and responses that the person and the technology perform in the interaction? Does the conversation work smoothly, or does it have rough spots? What are the categories of people, things, actions, environments, etc? What are the goals of the people in the interaction? How are those goals met or not met by the system?

3. Use the map, along with your observations and gut feelings, **to identify opportunities for making the interaction a better experience**. With your team, brainstorm alternatives that will work. Your team will brainstorm alternatives of task, timeline or material that will substantially improve the interaction and make it a better experience. Present a coherent vision for changes to the system. Explain why you are making the changes. Identify the improvements you are suggesting, and how they will work. Feel free to identify both near-term and far-term possibilities for an improved interaction design.

Deliverables
4. Create **a PowerPoint or video presentation** that shows the interesting parts of your material (video/stills/observations) as well as the structure of the interaction and the suggested improvements that will transform or improve the interaction. You will have a chance to talk about the interaction in class while you are presenting. You should come prepared with your presentation burned to a Mac compatible CD.

Materials
Digital video and/or digital photographs. PowerPoint. Paper for brainstorming and note taking, diagrams, sketches etc.

Purpose
Once reviewing the ethnographic material – either tapes or digital photos – you will note the following:

04. What is the material of interaction?
05. What is the time signature of the interaction – where does it start and where does it end?
06. What are the tasks performed in the interaction?
07. What are the Mission Critical tasks on which the interaction depends?
08. How can the interaction be improved?

The purpose of the project is to practically apply the methods of interaction reviewed in class:

- Ethnographic Observation
- Video Ethnography
- Photographic and Video documentation
- Observation with Paper Prototypes
- Cognitive Human Factors
- Social Human Factors

PRINCIPLES 0F **INTERACTION DESIGN** PROJECTS

Design and build an object or an environment that responds to a single action from a user.

Schedule: 2 weeks

This project will engage all of the learning outcomes (1-5) for this course.

Due Dates:

Week 8:
Research
Go to toy stores and look at Interesting toys, talk to kids and toy store people – I suggest Master Mind Toys www.mastermindtoys.com/

Concept roughs
- decide on your single interaction toy interface
- create a "user scenario" by imagining and then writing or diagramming out the steps that will be required to effectively **use** or **play** with your toy.
- create a diagrammatic drawing of your single interaction toy.

Week 9:
Demonstration and hand-in.

In-Class Demonstration & User testing!

Hand-in: Your user scenario & your diagrammatic drawing of your object or environment. We will create photo documentation of your projects in class.

PROJECT 3:

Cognitive Interactive Interfaces:
Design a single-interaction Toy!

Project Description
You are to design and prototype a toy with an **interactive interface** - that invites and responds to a **single action** from a user.
The interface must:
01. Be designed for a clearly identified user audience. Define your user audience, by age range, sex, and interests.
02. Communicate clearly by form mapping alone what the intended action must be on the part of the user.
03. Not rely on instructions, semantics or directions.
04. Must clearly indicate where the user needs to engage the interface;
05. Must clearly indicate the desired direction of the user's action.
06. Your object/environment has to react to the user in a way that the user perceives as a response to their action.
07. Must result in a surprising and meaningful conclusion that clearly indicates the end of the time signature for the interaction.
08. Create a clever and fun interaction. Try to create a visceral or emotional response in the user.

Important Considerations:
1 Examples of a "single action" are: push, pull, lift, turn, click, drag, spin, sniff, lick, listen, etc. Ideally, your interactive interface will be fun and use a multitude of sensory triggers and feedback. Try a rich combination of sight + smell + tactile + taste + audio feedback.
2 Setting up the interactive interface for use, and approaching the interface do not count as actions. The interactive interface does not have to automatically 're-set'.
3 The interaction must have a distinctive time signature – your user must understand how to start the interaction, and when it is over.
4 Introduce an element of surprise. This is most effective to show that the interaction has 'worked' and that it is accomplished & finished.
5 The interface does not have to be "pretty" - but it must work!

Purpose
The purpose of the project is the practical application of cognitive mapping using metaphor as the primary indication of where the user must engage the interface. A secondary aspect of this project is the concept of "good experience": the meaningful result of the action creates the interaction – either thoughtful, or provocative or humorous or all of these. The third is to create user scenario documents and to engage in user testing.

We will be demonstrating the interfaces in-class, and engaging in user testing with the 'think out loud' method of reporting our findings.

Attributes
The chief attribute of the metaphor used in the interaction is to indicate the direction of the action required by the user.

Materials
You can use any combination of materials that will aid in the creation of a "rich sensory experience". Some of these materials, but not more than 25% of your materials, may be pre-made or manufactured.

PRINCIPLES 0F **INTERACTION DESIGN** PROJECTS

Project Description
This is a team project that integrates all you have learned during the term in a two-stage project. You will work in teams of four-six and your team will collaborate with all other teams in the class, and within 1st year Design, for the final result. The final deliverable of this project is a class effort: a design to **Activate Butterfield Park.**

The class is responsible for collaborating, and planning, designing and creating an activation experience which is lightweight and portable, is within the budget, and can be recycled effectively.

Due Dates:

01. Scenarios are due for presentation and hand-in week 10. Scenarios are marked individually.
02. Team Design Concepts, budgets and visualisations are due in week 11.
03. Final Show assembly is during week 12, in the auditorium.
04. Activate the Park opens on March 30th.
05. Tear down and recycle is on March 30-31st.

All students must participate in all stages and all aspects of this important project.

The Activate the Park Show will take place in Butterfield Park at OCAD on March 30th from 3:00-6:00. All 1st year Design Students will participate.

PROJECT 4: TERM PROJECT

An Integrated Interaction : Activate the Park!

This is a group, class and 1st Year Design Collaborative Project. Within the outdoor environment of Butterfield Park, each element of an interaction will be designed and prototyped by individual teams within each class, and individual classes within 1st Year Design; thus the activation of the Park will be a large, collective team effort. The class will divide into approximately 5-6 teams. Each team will select a leader and the leaders should meet at regular intervals to insure progress and the current status of the project. Each team will be responsible for an individual and designated part of the class project, and all effort will be directed towards a joint class project.

In the 1st stage each member of the class will produce a User Scenario that describes an experience or narrative that can be designed for users in the Park. All scenarios will be presented in class and discussed by all members. The class will vote and then agree on a common experience scenario. Teams will be formed to create visualizations, refine scenarios, create marketing and documentation, and to take on roles and responsibilities for creating the experience.

In the 2nd stage each team will further design their assigned interaction and produce a refined user scenario, specifications for the project and visualisations. Functionality, intuitive cognition and clear sequence of tasks to be performed are critical. The audience for the experience must be considered. Aesthetics should also be considered. Visualisations, and prototype models (if appropriate) will be created to investigate and demonstrate the working concepts.

In the 3rd stage the teams will assemble the project in the designated working space in the auditorium room 190, to be shared by all 16 sections of Interaction Design students. The experiences will be installed in Butterfield Park on Thursday March 30th. We will invite the entire college to participate. Marketing & advertising pieces created by the marketing team will publicize the event. The documentation team will document the process of creating the class project, as well as the project within the show, and each of the other class projects.

In the 4th stage teams will all share in the teardown, disposal and recycling of the installations, during Thursday evening and Friday morning – all clean up to be completed by 12:00 pm March 31st. All students must participate in this important part of the project!

In the 5th stage we will critique and evaluate of the experience, to include self and peer evaluation. Each class will choose a winning category and project and award a prize. Documentation for the project will be designed and presented to the class.

Attributes: The chief attribute of the metaphors, narratives and interactions used are to experientially illustrate the potential to activate the Park. **Materials:** You can use any combination of lightweight, portable, recyclable materials. All materials must be recycled at the end of the Exhibition. **Budget:** There will be materials costs, depending on the scale and scope of the project, which will be shared equally by each class member. Materials and set-up costs will be budgeted and will range from $10-$20 each.